VivaScope

Cosmetic & Pharmaceutical Research > Cosmetic & Pharmaceutical Research > Aging

8 | **In vivo assessment of chronological ageing and photoageing in forearm skin using reflectance confocal microscopy.**

ABSTRACT

Background: Skin ageing is a complex process due to intrinsic chronological factors (chronoageing) and extrinsic environmental factors. The primary extrinsic factor is cumulative ultraviolet (UV) exposure, and is therefore termed photoageing. The current standards for measuring cumulative sun damage are biopsy histology and skin microtopography. However, skin biopsies are too invasive for population studies and skin replicas render only superficial skin architecture data. Reflectance confocal microscopy (RCM) is a noninvasive imaging tool that allows for in vivo imaging of the skin at quasihistological resolution.

Objectives: To define and identify RCM features associated with chronological ageing and photoageing on the forearm in two age groups with different skin phototypes and to assess whether these results agree with previous findings.

Methods: We obtained RCM images of dorsal and volar nonlesional skin of the lower forearm of 75 individuals with skin Fitzpatrick phototypes I-III in two age groups (20-30 years and 50-60 years). From each participant and body site, 21 RCM features were assessed and statistically significant differences between the two age groups and different forearm sites determined. Results RCM enabled identification of changes in architecture, cell morphology and extracellular matrix (collagen) at the level of the epidermis, dermoepidermal junction and papillary dermis. Changes that were correlated with chronological ageing and which were aggravated on the UV-exposed dorsal forearm were: loss of small skin furrows resulting in wider and less intersecting furrows; irregularity of the epidermal honeycomb pattern; irregularly distributed (mottled) pigmented keratinocytes/melanocytes; irregularity of the papillary rings and/or effacement of the rete ridges; and loss of thin collagen fibres and presence of collagen clods.

Conclusion: We have tested previously reported and new parameters for skin ageing evaluation by RCM, and identified 15 statistically significant RCM features that can be used to quantify ageing and photoageing in forearm skin noninvasively.